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# Problems of air pollution prevention in key regions of China

TAO XingJian

*Department of Math and Sciences, Bard College, Annandale-on-Hudson 12504, New York, USA*

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According to the World Health Organization, around two million people die prematurely from the effects of polluted air every single year. Air pollution is a huge problem especially for people living in "smog-choked" cities. In China, these polluted cities accumulate at Beijing-Tianjin-Hebei, Yangtze River Delta, and Pearl River Delta regions, involving 19 provincial level jurisdictions and 117 cities. These places are called the key regions because of these three regions. These areas cover only 14% of the country's land area, but account for nearly half (48%) of the country's population, 71% of the nation's GDP, 52% of the country's coal consumption. More significantly, the air pollutant emission level is 2.9–3.6 times higher than the nation's average. Therefore, a comprehensive plan of pollution control is desperately needed. Fortunately, on December 5, 2012, the Chinese government issued a comprehensive air pollution prevention and control plan named "12th Five-Year Plan on Air Pollution Prevention and Control in Key Regions". The plan has a long list of specific projects that are estimated to require 55.6 billion USD (350 billion RMB) investment (http://www.epa.gov/ogc/china/air%20pollution.pdf). What is the goal of this plan? Is there any problem?

In the past 30 years, China's rapid development made itself one of the most influential countries in the world. However, it also raised serious air pollution problems. In order to meet a long-term development goal, the government sets ambient concentration targets for the first time in 2011. The 12th Five-Year Plan requires key regions (including the city clusters) to reduce ambient concentration of $SO_2$ and PM10 by 10%, $NO_2$ by 7%, and PM2.5 by 5%. The plan also requires the three key regions to reduce PM2.5 concentration by 6% by 2015 (http://www.epa.gov/ogc/china/air%20pollution.pdf), and also makes it a binding target for local government in these regions.

However, in order to successfully implement the plan, the Chinese government needs to solve several major problems. One of these problems is obsolete air management. The current environment management model is hardly appropriate for the requirements of air pollution prevention. According to the current management system, local government is responsible for the environment quality in its governed area only, making it hard to solve regional air quality issues. Strength lies in numbers. Therefore, regional air environment issues require the establishment of an integrated, unified planning mechanism between the local cities.

The second problem is that pollutants such as nitrogen oxides ($NO_x$) and volatile organic compounds (VOCs) have not set up monitoring. Therefore, it cannot reflect the current air pollution situation. For a long time, China has not established a comprehensive multi-pollutant control system aimed at improving air quality. The main focus of the pollution control has been on $SO_2$ and PM from industrial sources. Fortunately, 195 stationary monitoring stations for multi-pollutant has already been built in key regions, and the assessment of the concentration of PM2.5 and $NO_x$ will be set up soon.

The last and the most serious problem is that the existing pollution control efforts have difficulties in meeting the urgent demand of the public to improve the quality of ambient air. The next five years are an important period in es-

email: txingj@gmail.com

tablishing a prosperous society. The GDP (gross domestic product) of the key regions will increase by over 50%, the total consumption of coal will increase by over 30%, and the total number of cars (including low-speed vehicles) ownership will increase by 50% in 2015. Based on the current pollution control efforts, $SO_2$, $NO_x$, industrial PM, and VOC emissions were 1.6, 2.5, 1.0 and 2.2 million tons respectively, accounting for 15%, 22%, 17%, and 20% of the total emission in 2010. As a result, the room for further reductions is shrinking.

Air pollution can harm people's health, damage crops or stop them growing properly, and make the world unpleasant and unattractive in a variety of other ways. If the Plan is successfully implemented, the expected results are $SO_2$ emission reduction of 2.28 million tons per year, $NO_x$ emission reduction of 3.59 million tons per year, PM emission reduction of 1.48 million tons per year, and VOC emission reduction of 1.525 million tons per year. The plan is also expected to bring over 317 billion USD (2 trillion RMB) society benefits. More importantly, the prevention of emission could reduce lung disease such as COPD which has already been proved to have a correlation to air pollution (http://datacenter.mep.gov.cn/).

As China becomes increasingly prosperous, the role of the key regions in China is doomed to be increasingly significant. Maintaining the key regions a healthy way of development is always a major task of the central government of China. On the other hand, air pollution control is also a ponderous burden which people have to shoulder and try to make it right. Only in this way, the government could meet a long-term development goal, and people could live in a sustainable society.